5:00

826-5 Non-Linearity of the LA Pressure-Volume Relationship: An Intraoperative Echocardiographic Study

M.J. Garcia, N. Smedira, N. Greenberg, J. Wong, L. Rodriguez, J.D. Thomas. *The Cleveland Clinic Foundation, Cleveland, OH, USA*

Background: In-vitro and animal studies suggest that LA pressure-volume relationship is non-linear, increasing at higher load.

Methods: We studied 9 patients (pts) undergoing heart surgery before (BCPB) and during partial cardiopulmonary bypass (PCPB) to alter loading conditions. High fidelity LA pressure (LAp) and pulmonary venous Doppler velocities were digitally stored and analyzed off-line. Pre-systolic LA volumes (LAV) were measured echocardiographycally using epicardial tranducers. Instantaneous changes in LA volume (dV/dt) during LV systole were estimated as a ratio of systolic to total velocity time integral of the pulmonary venous (PV) flows multiplied by LV stroke volume. In 3 pts with mitral regurgitation, regurgitant volume was estimated using the proximal flow convergence method and added. LA stiffness ((dp/dt)/(dV/dt)) was calculated at BCPB and PCPB.

Results: (Mean ± SD):

Stage	BCPB	PCPB	p
Stroke volume (ml)	45 ± 14	31 ± 11	0.003
Pre-systolic LAV	82 ± 46	49 ± 30	0.06
Pre-systolic LAp	17 ± 6	12 ± 5	0.04
LA stiffness	0.38 ± 0.26	0.18 ± 0.14	0.03

Conclusions: During ventricular systole LA stiffness increases at higher LA pressure, indicating a non-linear volume pressure relationship. These findings provide an explanation for the development of PV flow systolic blunting and reversal in pts with LV dysfunction and severe MR.

5:15

826-6 Transesophageal 3-Dimensional Echocardiographic Study of Coronary Arteries: Methodology, Feasibility and Location of Coronary Artery Stenosis

J. Yao, M.A. Taams, P.J. de Feijter, F.J. Ten Cate, L.A. van Herwerden, J.R.T.C. Roelandt. *Thoraxcenter, Erasmus University Rotterdam, The Netherlands*

Three-dimensional transesophageal echocardiography (3DTEE) results in high resolution images of the heart. How well it can be used for examining the coronary arteries (CA) and for detecting CA stenosis is of clinical significance in predicting ischemic events.

Aim: To examine the feasibility and methodology of 3DTEE in visualizing CA and detecting stenotic lesions.

Methods: 3DTEE was performed using rotational scanning at mid-esophageal window with a 3D acquisition system integrated in a commercially available ultrasound unit with ECG and respiratory gating. Of the 46 pts (age 18–85 yrs) studied, 25 were consecutive underwent routine TEE exam and 21 underwent cardiac surgery. Among them, 28 had CA angiography (CAA) and stenoses of 1 or more segments were found in 16 pts. 3DTEE was analyzed using secondarily derived 2D views. CA lumen extraction and 3D reconstruction to obtain the origin and path of CA and site of stenosis.

Results: In all patients, various segments of CA were examined along with other cardiac structures. The observed frequency/length of the left main, circumflex, anterior descending and right CA were 100%/4–22 (12 ± 4) mm, 100%/6–36 (15 ± 6) mm, 98%/13–60 (30 ± 12) mm and 72%/6–36 (18 ± 9) mm, respectively. In those 28 pts with CAA, 53 of 118 segments showed various degrees of stenosis by 3DTEE. In comparison with CAA, the sensitivity, specificity, positive and negative predictive value of 3DTEE for detecting CA stenosis were 85%, 80%, 79% and 86%, respectively. In addition, the spatial pathways and variations of CA was also obtained.

Conclusion: 3DTEE yields good definition and useful information about the proximal segments of CA and may be applied clinically to detect stenotic lesions.

827 NHLBI 50th Anniversary Commemorative Abstract Presentation Session: Optimal Risk Factor Management

Monday, March 30, 1998, 4:00 p.m.–5:30 p.m.
Georgia World Congress Center, Room 261W

4:00

827-1 The Beneficial Effect of a High-Fat, High-Protein, Low-Carbohydrate Diet on Body Weight and HDL Cholesterol

F. Lopez-Jimenez, R. Heilbron, M. Altman, H. Korn, G.A. Lamas, A.S. Agatston. *Mount Sinai Medical Center and the University of Miami School of Medicine, Miami Beach, FL, USA*

Background: Low-fat, high-carbohydrate (CHO) diets decrease both LDL and HDL cholesterol and are associated with poor patient compliance.

Methods: To test the effectiveness of a low-CHO, relatively high-fat and high-protein (PR) diet on weight loss and lipids, we prospectively assessed 78 overweight patients (102.8 ± 36 lbs), 63% males, mean age 61.2 ± 12 years with a mean follow-up of 132 days. The diet consisted of four stages: I) 10% CHO, 28% PR, 62% fat for two weeks; II) 27% CHO, 33% PR, 40% fat for two weeks; III) 36% CHO, 30% PR, 34% fat for two weeks, IV) 45% CHO, 30% PR, 25% fat for the remainder of the diet period. Only carbohydrate calories were restricted.

Results: The overall weight loss was 7.2 ± 11.3 lbs, p = 0.0001, and 11.3 ± 7.7 lbs, p = 0.0001 among the 77% of patients who lost at least 1 lb. Serum HDL cholesterol increased 7.2 ± 41 mg/dl (15%), p = 0.027 in the overall group, and 9.8 ± 47 mg/dl (20%), p = 0.001 in patients who did lose weight. Triglyceride levels decreased 36.6 mg/dl (19%) p = 0.004, and 36.0 ± 75 mg/dl (20%) p = 0.004 in the total sample and in those who lost weight, respectively. Total cholesterol and LDL cholesterol did not change significantly. The majority of patients (92%) reported that they would recommend the diet to others.

Conclusions: A low-carbohydrate, relatively high-fat and high-protein diet was associated with significant weight loss and an improved lipid profile. Prospective studies comparing this diet with more conventional high carbohydrate, low-fat diets are needed.

4:15

827-2 Attainment of LDL-Cholesterol Goals in a National Sample: Results From the Lipid Treatment Assessment Project (L-TAP)

T.A. Pearson, I.M. Laurora. *For L-TAP: Parke-Davis, Division of Warner-Lambert Company, Morris Plains, NJ, USA*

The National Cholesterol Education Program Adult Treatment Panel II has recommended LDL-cholesterol (LDL-C) goals for the treatment of hypercholesterolemia, but the extent to which these goals are reached in typical primary care practices is poorly defined. To study this, we surveyed 901 primary care physicians in all regions of the U.S. who are frequent prescribers of lipid-lowering drugs. Each physician then submitted clinical data and a fasting blood sample from sequentially selected patients currently being treated for hypercholesterolemia. A total of 5,601 patients were enrolled. Treatment success was defined by attainment of LDL-C goal for low risk (≤1 risk factor), high risk (≥2 risk factors) or coronary heart disease (CHD) patients. Overall, frequency of treatment success varied significantly by risk group ($P < 0.001$) and non-drug versus drug therapy ($P < 0.001$):

Percent Success

Risk Group	LDL-C Goal	Non-drug Rx	Drug Rx	Overall
Low	< 160 mg/dl	59	70	68
High	< 130 mg/dl	22	40	37
CHD	<100 mg/dl	7	18	16

Factors associated with these low rates of success were: lack of drug therapy in high risk groups, use of low doses of drugs, lack of use of drug combinations, and drug combinations not including a statin. Despite clinical trials demonstrating efficacy of lowering LDL-C in high risk groups, a majority of these patients are not currently at their LDL-C goal. Physicians need to improve their skills in prescribing treatments which optimize LDL-C levels.

MONDAY ORAL